

The American Midland Naturalist

Devoted to Natural History, Primarily
that of the Prairie States

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VOL. X.

SEPTEMBER-NOVEMBER, 1927.

No. 11-12.

NEW SPECIES OF AULOPORA FROM THE DEVONIAN OF IOWA*

By MILDRED ADAMS FENTON.

I.—INTRODUCTION.

Members of the genus *Aulopora* are common in the Hackberry and Shellrock stages of the Devonian of Iowa and are uncommon in a third stage, the Cedar Valley. Those of the Hackberry have been described by Hall and Whitfield** and by Fenton and Fenton,*** but there have been no published accounts of *Aulopora* from the Shellrock and Cedar Valley stages. The purpose of this paper is to provide descriptions of such species from these stages as are now available and in addition, of two apparently new species from the Spirifer zone of the Hackberry. Many of the specimens studied are in the University of Cincinnati Museum, while others remain in the collection of Mr. C. H. Belanski. In addition to lending specimens, Mr. Belanski has provided detailed stratigraphic data for the descriptions.

Although the genus *Aulopora* commonly is placed among the tabulate corals, it seems to differ from the "bryozoan," *Stomatopora* in but one character: large size. More signifi-

* Contributions from the University of Cincinnati Museum. Geology and Paleontology. Number 1.

** Ann. Rep. N. Y. State Cab. Nat. Hist. p. 235, pl. 10, figs 5-6. 1873.

*** Stratigraphy and Fauna of the Hackberry Stage, pp. 64-69, pl. 16. 1924. *Aulopora maxima* has proved to be a member of the genus *Ceratopora* Grabau.

cantly, some of the species of *Aulopora* are scarcely distinguishable from large, dry, mud-incrusted specimens of the modern *Plumatella princeps*, a common fresh-water bryozoan. These and other relationships have caused me to doubt the anthozoan nature of *Aulopora*; but because no detailed study has been given the matter, I merely have refrained from using most terms that denote either bryozoan or anthozoan affinities for the genus.

II.—DESCRIPTION.

Aulopora stainbrookii n. sp.

Plate I, Fig. 12.

Description.—Colony prostrate, growing on the surface of a coral. Tubes attached throughout their entire length with the apertures directed obliquely or attached at the point of origin and directed vertically. Dimensions of two tubes: length 7.6 mm. and 6.5 mm.; transverse diameter at the point of origin 2.8 mm.; outside diameter at the aperture 2.5 mm. and 3.8 mm. The tubes show heavy wrinkles; any finer markings were lost in silicification. Apertures are round. Several weathered tubes show longitudinal markings.

Remarks.—The large and heavy tubes suggest that this form may be a *Ceratopora* but this point can not be determined until sectionable material has been found.

Occurrence.—Common in the "*Acervularia davidsoni*" beds of the Cedar Valley in the vicinity of Brandon, Iowa.

Holotype.—No. 6016, Collection of C. H. Belanski.

Aulopora multiramosa n. sp.

Plate I, Fig. 1.

Description.—Colony prostrate, branched, and attached to the surface of a stromatoporoid. Dimensions of three tubes: length 2.5 mm., 3.6 mm. and 2.9 mm.; transverse diameter of tube at the point of origin 1 mm., 1.2 mm. and 1.2 mm.; transverse diameter at the base of the tube below the aperture 1.5 mm., 1.6 mm. and 1.5 mm.; outside diameter of the aperture 0.2 mm., 1.1 mm. and 1 mm. The tubes are round and

bifurcate at every cell or every other cell; their surfaces bear fine concentric markings. The apertures are round, have thin walls and are directed vertically or obliquely. No tabulae noted.

Occurrence.—This is a rather uncommon form. It is known only from the Alveolites faunule at "Parker's Mill," Mason City, Iowa.

Holotype.—No. 870, Collection of C. H. Belanski.

***Aulopora modulata* n. sp.**

Plate I, Figs. 5-9.

Description.—Colonies branched, attached to surfaces of *Schizophoria*, stromatoporoids and corals. The tubes are small at the point of origin; enlarging gradually and turning upward in the latter third of the tube. The apertures are directed either obliquely or vertically, depending upon the height to which the tubes rise. Dimensions of three tubes; length 5.2 mm., 5.5 mm. and 5 mm.; transverse diameter at the point of origin 1.4 mm., 1.2 mm. and 1 mm.; transverse diameter at the base of the ascending portion of the tube 2.2 mm., 1.6 mm. and 2.2 mm.; outside diameter at the aperture 1.8 mm., 1.5 mm. and 1.6 mm.; greatest height 1.5 mm., 1.4 mm. and 1.6 mm. Tubes are finely wrinkled. One specimen shows one tabula.

Occurrence.—This species is common throughout the Schizophoria zone of the Rock Grove substage as well as in several of the members of the Nora substage. In general the tubes of the forms found in the Rock Grove beds are somewhat shorter and slightly more robust than those found in the Nora substage.

Holotype.—No. 1045; *Paratypes*.—Nos. 175, 1904, 2060, 2061, 2063, Collection of C. Belanski, Nos. 2034, 2035, University of Cincinnati.

***Aulopora noraensis* n. sp.**

Plate I, Fig. 5; Plate II, Figs. 8-10.

Description.—Colonies branched, prostrate, attached to surfaces of stromatoporoids and corals. Dimensions: tubes

2.6 to 5.9 mm. in length, those of the holotype ranging from 4.1 to 4.6 mm.; transverse diameter (in the holotype) 1.4 to 1.6 mm.

The tubes maintain approximately the same diameter throughout their length, and bifurcate at every cell or every other cell. The apertures are round, slightly constricted, and open either obliquely or vertically. The tubes of well preserved specimens are marked by fine wrinkles, which are absent in poorly preserved material. Usually there is one tabula present in each tube, as is shown in Plate II, Fig. 10.

Remarks.—This form is highly variable in the manner of its growth, since this largely is controlled by the nature of the host. It is one of the commonest *Auloporas* of the Mason City substage.

Occurrence.—Particularly common in the *Aulopora* zone, especially in the *Pachyphyllum* zonule at Nora Springs. It occasionally is found in the *Alveolites* zonule at Mason City, and less often in the *Craspedophyllum* beds.

Holotype.—No. 2025; *Paratypes.*—Nos. 2026, 2027 and 2039, University of Cincinnati, and No. 115, Collection of C. H. Belanski.

***Aulopora irregularis* n. sp.**

Plate II, Figs. 11-12.

Description.—Colonies irregularly massive or incrusting; attached to *Alveolites* and stromatoporoids. Dimensions: tubes 3 to 5 mm. in length, and 1.4 to 2.2 mm. in diameter. Apertures round, generally without constriction, and characteristically are directed vertically. Bifurcation commonly takes place at every cell, but the massed tubes, growing against and upon each other, make regularity impossible.

Remarks.—Several specimens, growing on stromatoporoids, have thick walls with marked growth wrinkles; in a few cases the erect portion of the tube reaches a greater height than is characteristic. The heavy-walled character is shown in Fig. 12, Plate I. A specimen from the *Alveolites* zone with

short tubes and heavy walls is doubtfully referred to this species.

Occurrence.—Aulopora zone; particularly common in the Pachyphyllum zonule at Nora Springs.

Holotype.—No. 2028; *Allotype* No. 2029, University of Cincinnati; *Paratypes*.—Nos. 708, 950, and 1128, Collection of C. H. Belanski.

Aulopora munda n. sp.

Plate II, Figs. 12-14.

Description.—Colonies palmately incrusting; attached to corals and stromatoporoids. Dimensions, of one tube in each of three specimens: length 3.4 mm., 4.7 mm. and 2.1 mm.; greatest diameter 1.4 mm., 0.8 mm. and 1.0 mm.; outside diameter at the aperture 0.7 mm., 0.7 mm. and 0.5 mm.

The tubes are either crowded or spread in a fan-like arrangement; the two types being portrayed by Figs. 13 and 14 of Plate II, respectively. The tubes remain distinct even though they are so closely crowded that they conceal the surface of the host; the tubes found in the fan-like arrangement are more distinct than those in the other type of growth. Tubes bud at the mid-length of the parent cells or at the anterior portion where the tubes are directed upward. One to three tubes bud from each parent cell. The tubes bear fine transverse markings.

Occurrence.—Rather uncommon in the Alveolites zonule at Mason City; uncommon in the Pachyphyllum zonule at Nora Springs.

Holotype.—No. 2031, University of Cincinnati; *Allotype*—No. 244, Collection of C. H. Belanski; *Paratype*.—No. 2032, University of Cincinnati.

Aulopora crebriformis n. sp.

Plate II, Figs. 17-18.

Description.—Colonies incrusting the surfaces of other organisms, particularly stromatoporoids. Dimensions: tubes 2

to 4.7 mm. in length, the average being 3.2 mm., and 1.7 to 1.9 mm. in transverse diameter; apertures 0.6 to 0.9 mm. in diameter.

The tubes are small at their origin, increasing in diameter toward the aperture. They are flattened and coalesced along their sides, so that in most specimens they entirely conceal the surface of the host. One, two or even three tubes are given off from each parent one. The apertures are round or slightly oval, are constricted, and are directed vertically even though they rise but little above the general surface of the tube.

Remarks.—This species resembles *Aulopora incrustans* F. and F., of the Hackberry stage, but differs from it in the greater length and width of its tubes, its larger and proportionately less elevated apertures, and somewhat more regular manner of growth. These differences, while not great, are constant in all specimens examined, and afford ready means of identification. For comparison with *Aulopora crebriformis*, a portion of the holotype of *A. incrustans* is illustrated on Plate II, Fig. 19.

Occurrence.—Very common in the *Lepidocentrus* zone, but particularly so in the *Camarophoria* zonule at Nora Springs. Uncommon in the *Prismatophyllum* zonule at Rudd and in the *Macgeea* zonule to the north of Nora Springs. The types are from the *Camarophoria* beds.

Holotype.—No. 2022; *Paratypes.*—Nos. 2023 and 2024, University of Cincinnati.

***Aulopora jugalis* n. sp.**

Plate II, Fig. 16.

Description.—Colonies incrusting surfaces of stromatoporooids. Dimensions: length of tubes 2.2 to 3.3 mm.; outside diameter of aperture approximately 1 mm.; apertures number 5 to 7 in the space of 10 mm., being very closely spaced.

The tubes are short and not very distinct; their walls coalesce so that they entirely hide the surface of the host. One or two tubes arise from each parent tube. The apertures are

round and scarcely rise above the genral surface of the tubes, which are delicate and poorly preserved. No tabule seen.

Remarks.—This form differs from *Aulopora incrustans* F. and F., of the Hackberry stage, (Plate II, Fig. 19), in having less distinct tubes which bear no wrinkles, heavier walls, and in having vertically directed and abruptly expanded apertures. It is separated from *Aulopora crebriformis* by its smaller size, proportionately shorter and less distinct tubes, and in the absence of marked constriction at the apertures.

Occurrence.—Confined to the Aulopora zone. It is especially common in the Alveolites zonule at Mason City.

Holotype.—No. 270; *Paratypes.*—No. 286, Collection of C. H. Belanski, and No. 2040, University of Cincinnati.

***Aulopora linearis* n. sp.**

Plate I, Fig. 10.

Description.—Colonies prostrate, attached to surfaces of other organisms or to indurated sediments. Dimensions of two typical tubes: length, including the aperture, 6 mm. and 7.3 mm.; transverse diameter at point of origin 1.7 mm. and 1.4 mm.; transverse diameter just posterior to the aperture 1.9 mm. in both; outside diameter of the aperture 2.9 mm. and 2.1 mm.; height of aperture above the base of attachment 1 mm.

When well preserved, the aperture is round; where not, it is oval. In a few examples in which the tubes are closely crowded it is polygonal. Evidence of tabulae appears only in weathered tubes, in which the tabulae appear to have numbered one or two, and to have passed directly across the tubes. Well preserved specimens show fine wrinkles, which are not visible in the figure.

Remarks.—Though this form resembles *Aulopora expansa* F. and F.* of the Owen substage of the Hackberry, it differs

* Stratigraphy and Fauna of the Hackberry Stage, p. 67, pl. 16, fig. 10. 1924.

from it in manner of growth. Unlike *A. expansa*, *A. linearis* does not branch out over the surface to which it is attached, but instead grows in linear series. At intervals the tubes are irregularly crowded but their general trend is in one direction.

Occurrence.—Confined to the *Lepidocentrus* zone at Nora Springs where the colonies are found attached to stromatoporoids and indurated sediments at the top of the *Camarophoria* zonule.

Holotype.—(in three parts) Nos. 1943, 2065, Collection of C. H. Belanski and 2021, University of Cincinnati.

***Aulopora elongata* n. sp.**

Plate I, Fig. 11.

Description.—Colonies prostrate, attached, branching. Dimensions of one tube: length 7.5 mm.; transverse diameter at point of origin 1 mm.; outside diameter of aperture 2 mm.; height of aperture above base of attachment, 1.3 mm.

The tubes are long, small at their point of origin, and enlarge gradually toward the aperture. The branches bifurcate at wide angles. A few tubes bear fine wrinkles, but no tabulae have been seen.

Remarks.—This species is based on a single poor specimen. Its characters, particularly of length and diameter of tubes, are so unusual, however, that there seems no ground for referring it to any other species, or for doubting that other specimens of the same form may be identified.

Occurrence.—Confined to the *Camarophoria* zonule at Nora Springs, where the tubes are attached to indurated sediments at the upper surface of the bed.

Holotype.—No. 848, Collection of C. H. Belanski.

***Aulopora confluens* n. sp.**

Plate I, Figs. 1-7.

Description.—Colonies consist of confluent, longitudinal, and apparently vertical series of tubes. All of the specimens

studied are fragmentary, one (the holotype), measuring 12 mm. in length. Dimensions: length of tubes 3 to 3.5 mm.; transverse diameter 0.7 to 0.9 mm.; outside diameter of aperture 0.7 to 0.9 mm.

Instead of being prostrate and attached, as is the common case in *Aulopora*, the series of tubes in this species are attached only to each other, and the resulting columns seem to have grown erect. The two specimens illustrated in Figs. 1 to 4 of Plate II each have three series of tubes; each tube is distinct and gives rise to a new one whose diameter at the point of origin is nearly as great as that of the parent. The surfaces are either smooth or finely wrinkled; the apertures are oblique, and the confluence of the tube-series rarely obscures the boundaries of each.

Remarks.—A third specimen, doubtfully referred to *A. confluens*, is illustrated in Figs. 6 and 7 of Plate II. In general size and character the tubes resemble those of the holotype, but they are somewhat more distinct, and are attached to a fragment (not rolled or worn) of *Orthopora ulrichi* F. and F. It seems probable that we have here the base of such columnar growths as are shown in Figs. 1 to 4.

Occurrence.—Pugnoides zonule, near the top of the Cerro Gordo substage of the Hackberry. It is found chiefly in the vicinity of Bird Hill and rarely at Hackberry Grove.

Holotype.—No. 3892; *Paratypes.*—Nos. 3670, Collection of C. H. Belanski; Nos. 2036, 2037 and 2038, University of Cincinnati.

***Aulopora delicata* n. sp.**

Plate I, Figs. 2-4.

Description.—Colony dichotomously branched, prostrate, attached to the surface of a stromatoporoid. Dimensions: length of a tube 1.6 mm.; transverse diameter at the point of origin 0.7 mm.; outside diameter at the aperture 0.7 mm.; height of tube above the base of attachment 1 mm.

As is indicated by the dimensions, the tubes retain virtually the same transverse diameter throughout their length, although a few tubes show slight constriction toward the apertures. These are round, and are directed either vertically or slightly obliquely. The walls are without marking, and no trace of tabulae has been found.

Occurrence.—The one specimen upon which the species is based was found in beds of Cerro Gordo age about one mile northwest of Juniper Hill. Its exact horizon is doubtful but probably is the *Heliophyllum* zonule.

Holotype.—No. 2033, University of Cincinnati.

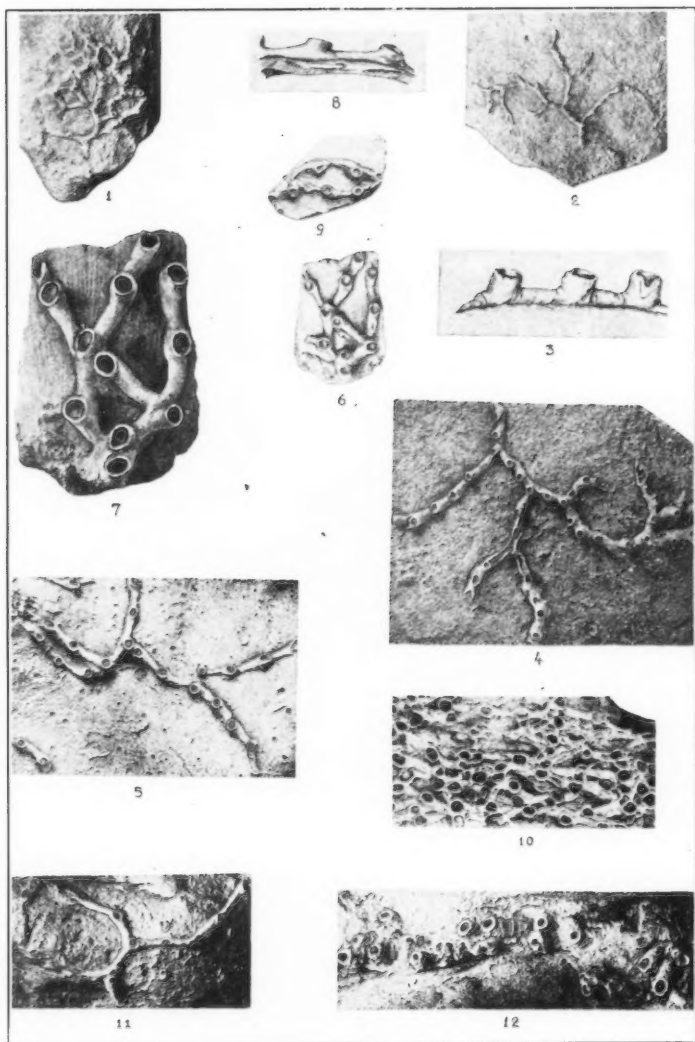


PLATE I.

[See page 382 for explanation.]

FIGURE

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EXPLANATION OF PLATE I.

FIGURE	PAGE
1. <i>Aulopora multiramosa</i> , n. sp. -----	374
Holotype (870 C.H.B.), x 1.	
2—4. <i>Aulopora delicata</i> , n. sp. -----	381
2. Holotype (2033 U.C.M.), x 1.	
3. Enlargement of the first three cells of the colony. x 8.	
4. Enlargement of the holotype. The position is reversed to better show the character of the species, x 2.	
5—9. <i>Aulopora modulata</i> , n. sp. -----	375
5. Holotype (1045 C.H.B.), x 1.	
6. Paratype (1904 C.H.B.), x 1.	
7. Same, x 2.	
8. Two cells of Fig. 7. x 2.	
9. Paratype (2060 C.H.B.), x 1.	
10. <i>Aulopora linearis</i> , n. sp. -----	379
Holotype (1943 C.H.B.), x 1.	
11. <i>Aulopora elongata</i> , n. sp. -----	380
Holotype (848 C.H.B.), x 1.	
12. <i>Aulopora stainbrooki</i> , n. sp. -----	374
Holotype (6016 C.H.B.), x 1.	

EXPLANATION OF PLATE II.

FIGURE	PAGE
1—7. <i>Aulopora confluens</i> , n. sp.	380
1. Paratype showing mode of growth (3670 C.H.B.), x 2.	
2. Another view of the same, showing the reverse side, x 2.	
3—4. Two views of the holotype (3892 C.H.B.), x 2.	
5. Longitudinal section through a colony (2037 U.C.M.), x 4.	
6—7. Two views of an adnate colony that probably represents the attachment of <i>A. confluens</i> . Paratype (2036 U.C.M.), x 2.	
8—10. <i>Aulopora noraensis</i> , n. sp.	375
8. Holotype, attached to the surface of a stromatoporoid (2025 U.C.M.), x 2.	
9. A colony growing about an idiostromid. The drawing shows the specimen unrolled. Paratype (2026 U.C.M.), x 2.	
10. Longitudinal section through two tubes showing the position of a tabula in one. (2039 U.C.M.), x 5.	
11—12. <i>Aulopora irregularis</i> n. sp.	376
11. Colony of tubes growing over each other. Holotype (2028 U.C.M.), x 1.	
12. Colony attached to an idiostromid. Paratype (708 C.H.B.), x 1.	
13—15. <i>Aulopora munda</i> n. sp.	377
13. Two colonies of this form attached to an idiostromid. Holotype (2031 U.C.M.), x 1.	
14. Right-hand colony of Fig. 13 enlarged to show the fanlike arrangement of the tubes, x 2.	
15. Allotype, showing the cells crowded together but not in fanlike arrangement (244 C.H.B.), x 2.	
16. <i>Aulopora jugalis</i> , n. sp.	378
A colony with the tubes entirely covering the surface of a stromatoporoid. Holotype (270 C.H.B.), x 1.	
17—18. <i>Aulopora crebriformis</i> , n. sp.	377
17. Holotype, incrusting the surface of a stromatoporoid (2022 U.C.M.), x 1.	
18. The same, enlarged, x 2.	
19. <i>Aulopora incrustans</i> , F. and F.	379
A portion of the holotype, introduced for comparison with Figs. 15 and 16. Holotype (8091 Univ. of Mich.), x 1.	

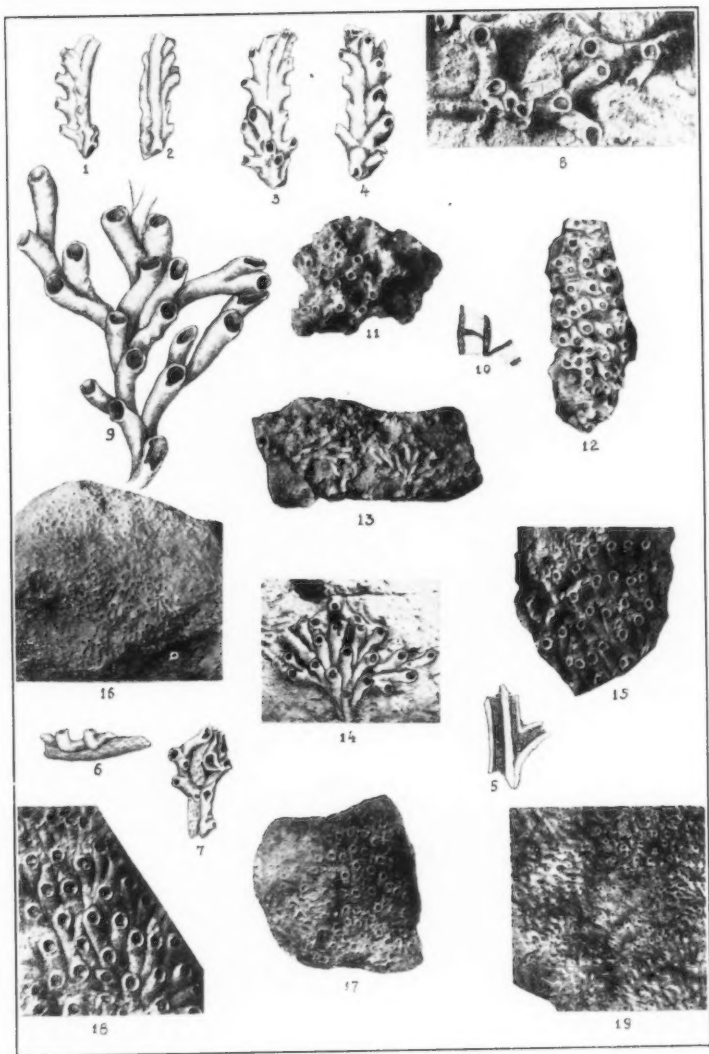


PLATE II.

[See page 384 for explanation.]

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THE SPECIES OF POLYGONATUM.

By BENJAMIN FRANKLIN BUSH

From my earliest acquaintance with the Solomon's Seals, I was mystified with the species names, and descriptions, no two authors agreeing as to the names and range of the species, and most of them differing in different editions of their manuals and floras.

I did finally conclude in 1900 that in the West here, we had a species that seemed by general consent to be *P. commutatum*, while in the East there was something or some species that no one understood or knew anything about. This opinion of mine is found in the Manual of the Flora of Jackson County, Missouri, which was published in 1902.

After the publication of the Manual, I put the whole matter of the species of POLYGONATUM into the pile of unsolved problems, and it remained there until I saw Farwell's paper on the Michigan species of Polygonatum.¹ This paper of Farwell's which presented five species and six varieties, threw some light on hitherto obscure places, and made more obscure some things already too dark for me.

Having no herbarium material in hand to examine, I could only observe and study the plants that grew here in Western Missouri, and I was soon convinced that we had three of the species, varieties or forms given by Farwell, which could be distinguished without much effort. Of the remaining eight species and varieties given by Farwell, they were entirely unknown to me, although it began to look to me that he was more than a little right about some of them.

Matters remained about thus until in the spring of 1917, when Gates published his Revision of the genus POLYGONATUM,² in which he recognized nine species and five varieties, accepting all of Farwell's species and varieties excepting *P.*

1 Bull. Torr. Club 42; May, 1915.

2 Bull. Torrey Club 44; March, 1917.

boreale, which he reduced to *P. pubescens*, and presenting five species not mentioned by Farwell. This paper of Gates' was a long step in advance of Farwell's, and satisfactorily disposed of several species that Farwell brought out only to make still more obscure, namely: *P. biflorum* (Walt.) Ell., *P. biflorum hebetifolium* Gates, *P. commutatum virginicum* (Greene) Gates, and *P. commutatum ovatum* (Farwell) Gates.

I have examined several hundred sheets of specimens of POLYGONATUM from Indiana, many from Illinois, Missouri, Iowa, Michigan, Minnesota, New Jersey, Massachusetts, New York, Ohio and nearly all the States in New England, and I have come to these conclusions: first, that Farwell's list of five species and six varieties must be reduced to seven, as four of his names must be referred to two of his other species. Secondly, Gates' list of nine species and five varieties must be reduced to ten, and more study of the species and better collections may reduce this number still further.

My conception of the species of POLYGONATUM is therefore quite at variance with both Farwell and Gates, both as to the identity of the species themselves, and the range of some of them. I have seen nearly all of Farwell's specimens, including the type material of all of his new species and varieties, for the loan of which I am under many obligations. I am also under many obligations to Prof. William Trelease, Mr. Charles C. Deam and Mr. Kenneth K. Mackenzie, for the loan of all their material to study, to whom I hereby return thanks.

1. POLYGONATUM PUBESCENS (Willd.) Pursh, Fl. Am. Sept. 23, 1814.

Convallaria pubescens Willd. Hort. Berol 45, pl. 45, 1805.

Polygonatum multiflorum Americanum Hook Fl. Bor. Am. 1: 176, 1840, in part.

? *Convallaria hirta* Bosc; Poiret, Encyc., 4: 369. 1796.

? *Polygonatum hirtum* (Bosc) Pursh, Fl. Am. Sept. 234. 1814.

Polygonatum biflorum A. Gray, Man Ed 2, 466, 1856, not *Convallaria biflora* Walter, 1788.

Salomonina biflora Farwell, Rep. Com. Parks, Detroit 11: 53. 1900, not *Convallaria biflora* Walter 1788, as to synonymy, not as to specimens.

Polygonatum biflorum Am. authors, in large part, not *P. biflorum* (Walt.) Elliott, 1817.

"*Polygonatum hirtum*" Gates, l.c., very probably the same as *P. pubescens* Pursh, which, if proven to be the same, must hereafter be known as *P. HIRTUM* (Bosc) Pursh.

TYPE LOCALITY: North America.

Michigan, Massachusetts and New Jersey, according to Farwell l.c. 253, 1915, but some or all these localities may be based on specimens of *P. boreale*, which Farwell did not distinguish from *P. pubescens* in the herbarium at the time he published his paper. The figure on plate 12, of his paper very clearly illustrates this distinct species, but the figure on Plate 13, A, undoubtedly represents *P. boreale*.

Massachusetts, North Carolina, South Carolina, Wisconsin, Michigan, Connecticut, New Jersey, Pennsylvania, Virginia, Indiana and Minnesota, according to Gates, l.c., 118, 1917, but some or nearly all of these localities must be based on specimens of *P. boreale* which Gates did not accept, being misled by Farwell, but I think *boreale* is distinct enough to recognize as a species.

SPECIMENS EXAMINED:

MICHIGAN:

Biological Station, *Deam* 28720, July 12, 1919 D. Herb.; this is the only collection seen from Michigan, all others, including Farwell's specimens, being *P. boreale*.

NEW JERSEY:

Greenwood Lake, *Mackenzie* 2574, May 19, 1907, M. Herb.

MAINE:

Orono, *Knight*, May 28, 1905, M. Herb.

INDIANA:

Vernon, *Deam* 24745, May 14, 1918, D. Herb.

2. *Polygonatum boreale* Greene, Leaflets, 1: 181. 1906. *Salomonina biflora* Farwell, in part, Rep. Com. Parks Detroit II: 53. 1900, not *Convallaria biflora* Walter, 1788.

Polygonatum biflorum American authors, in part, not *P. biflorum* (Walt.) Elliott, 1817.

Polygonatum boreale australe Farwell, Bull. Torr. Club 42: 254. 1915.

Polygonatum pubescens Farwell, in part, as to specimens, and specimens cited, not *P. pubescens* (Willd.) Pursh, 1814.

Polygonatum pubescens Gates, in part, as to specimens and synonymy, not *P. pubescens* (Willd.) Pursh, 1814.

TYPE LOCALITY: Winona, Minnesota.

Michigan, and Minnesota, according to Farwell, the latter locality taken from Greene, l.c. 181, 1906.

No localities cited for this species by Gates, who being misled by Farwell as to the identity of the true *P. pubescens*, did not distinguish this species from that.

SPECIMENS EXAMINED:

MINNESOTA:

Little Pine Lake, Ottertail County, *Chandonnet*, May 30, 1910, M. Herb.

MICHIGAN:

Lake Harbor, *Umbach*, May 28, U. of Ill. Herb.; Montgomery County, *Deam* 12779, May 16, 1913, D. Herb.

INDIANA:

Carmel, *Deam* 12677, May 11, 1913, D. Herb.; Chestnut Ridge, *Deam* 5658, April 25, 1910, D. Herb.; Eaton, *Deam* 23128, May 25, 1917, D. Herb.; Fort Wayne, *Deam* 15832, May 31, 1915, D. Herb.; Garrett, *Deam* 3084, May 17, 1908, D. Herb.; Goshen, *Deam* 19576, May 11, 1916, D. Herb.; Greentown, *Deam* 5947, May 15, 1910, D. Herb.; Juliett, *Deam* 10509, May 14, 1912, D. Herb.; Kendallville, *Deam* 15848, June 6, 1915, D. Herb.; Lafayette, *Deam*, May 5, 1900, D. Herb.; Marion, *Deam* 19799, May 23, 1916, D. Herb.; Marion County, *Deam*, April 30, 1905, D. Herb.; McGaugh-

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ey's, *Deam*, 13479, June 29, 1913, D. Herb.; Medora, *Deam*, 24778, May 15, 1918, D. Herb.; Michigan City, *Deam* 6427, May 22, 1910, D. Herb.; Mongo, *Deam* 15702, May 17, 1915, D. Herb.; Rome City, *Deam* 6780, June 20, 1910, D. Herb.; Saint Joe, *Deam* 20849, August 17, 1916, D. Herb.; South Bend, *Deam* 19540, May 10, 1916, D. Herb.; Stroh, *Deam* 15957, June 5, 1915, D. Herb.; Stroh, *Deam* 15948, June 5, 1915, D. Herb.; Unionport, *Deam* 19678, May 16, 1916, D. Herb.; Upland, *Deam* 15801, May 22, 1915, D. Herb.; Vernon, *Deam* 24745, May 14, 1918, D. Herb.

NEW HAMPSHIRE:

Hanover, *Hitchcock*, May 25, 1903, U. of Ill. Herb.

OHIO:

Parma, *Ashcroft*, June 1885, U. of Ill. Herb.

MAINE:

South Chesterville, *L. O. E.* May 20, 1899, U. of Ill. Herb.

MASSACHUSETTS:

Russell, *Rusby*, May 31, 1873, P. D. & Co. Herb. This specimen is cited by Farwell, l.c. 253 1915, as typical *P. pubescens*, but it is not that species; Williamstown, *Nason*, May, year not given, U. of Ill. Herb.

NEW JERSEY:

Boonton, *Trelease*, month not given, 1913, U. of Ill. Herb.; Franklin County, *Rusby*, August, 1879, P. D. & Co. Herb. This specimen is also cited by Farwell, l.c. 253, 1915, as typical *P. pubescens*, but it has nothing to do with that species. This specimen and the Rusby specimen cited above from Massachusetts are labeled *P. biflorum*, but the name *biflorum* is crossed out on both labels with pencil and the name *pubescens* written on the labels by Farwell.

3. POLYGONATUM CUNEATUM Greene, Leaflets, 1: 171. 1906.

Polygonatum pubescens cuneatum (Greene) Farwell, Bull. Torrey Club 42: 253. 1915.

Stems terete, 4-5 dm. tall or less, 2-4 mm. in diameter; leaves on the stem nine to thirteen, elliptical, lanceolate or

ovate-lanceolate, or narrowed at the base, amplexicaul, subsessile, or short-petioled, green above, pubescent or the nerves below, 18-35 mm. wide by 6-12 cm. long; three to seven of the nerves more or less prominent; peduncles short, about 12 mm. long, one or two-flowered; pedicels shorter than the peduncles; flowers 8-10 mm. long, 2-3 mm. thick, occasionally sessile, the cylindrical tube yellowish-white, or white in dry specimens; filaments filiform, papillate, the free part shorter than the anthers; mature fruit globular, 8-10 mm. in diameter; seeds three to nine, 4 mm. wide.

TYPE LOCALITY: Turin, Marquette County, Michigan.

Michigan, according to Farwell, who misunderstanding *P. pubescens*, made this species a variety of that species, but evidently intending to place it under *P. boreale*, as his reference of Rusby's specimens of *P. boreale*, to *P. pubescens* easily proves. It has nothing to do with *P. pubescens*.

Connecticut, Pennsylvania and Michigan, according to Gates, who made the same mistake of placing this under *P. pubescens*, following Farwell.

SPECIMENS EXAMINED:

INDIANA:

Fort Wayne, *Deam* 15832, May 31, 1915, D. Herb.; Lynn, *Deam* 19693, May 16, 1916, D. Herb.; Turkey Run, *Deam* 9917, September 2, 1911, D. Herb.; Wells County, *Deam*, May 16, 1897, D. Herb.

4. POLYGONATUM FARWELLII B. F. Bush, n. sp.

P. boreale multiflorum Farwell, Mich. Acad. Sci. Rept. 20: 170. 1918, not *Convallaria multiflora* L. 1753.

TYPE LOCALITY: Walled Lake, Michigan.

Stems 8-12 dm. tall, with 14-16 leaves; leaves 7-10 cm. long, 3-4 cm. wide, with 7-9 principal veins, ovate, lanceolate or elliptical lanceolate, tapering to each end, blunt at apex, closely and short pubescent on the secondary veins beneath; peduncles short, 1-2 cm. long, the upper 2-flowered, the lower 3-4-flowered; flowers greenish, 8-10 mm. long, and 2 mm.

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thick. Differs from *P. pubescens* and *P. boreale*, in the much larger, more numerous leaves, larger flowers and longer peduncles.

This is certainly very distinct from *P. boreale*, Greene, which is very common in northern Indiana and Michigan. The Yuncker collection exactly matches Farwell's type specimens.

SPECIMENS EXAMINED:

MICHIGAN:

Walled Lake, *Farwell* and *Chandler* 4488, June 15, 1917, TYPE, P. D. & Co. Herb.; Haslet, *Yuncker* 261, June 17, 1917, U. of Ill. Herb.

5. POLYGONATUM BIFLORUM (Walt.) Elliott, Bot. S. Car. & Ga. 1s 393. 1817.

Convallaria biflora Walt. Fl. Car. 122. 1788.

Polygonatum angustifolium Pursh, Fl. Am. Sept. 234, 1914.

Convallaria angustifolia (Pursh) Schult. Syst 7: 301, 1829.

Polygonatum multiflorum b *americanum* Hook. Fl. Bor. Am. 2: 176. 1840, in part.

TYPE LOCALITY: Southeastern United States.

North Carolina, South Carolina and (doubtfully) Pennsylvania, according to Gates.

Atlantic seaboard, according to Farwell, but the specimen cited and on Pl. 15, fig. A., represents another species.

6. POLYGONATUM HEBETIFOLIUM (Gates) B. F. Bush.

P. biflorum Farwell, Bull. Torr. Club 42s 254. Pl. 15, fig. A, 1915, not *P. biflorum* (Walt.) Elliott, 1817.

TYPE LOCALITY: North Carolina.

New York, New Jersey, Pennsylvania, District of Columbia, Kentucky and North Carolina, according to Gates, l.c. 121, 1917.

SPECIMENS EXAMINED:

GEORGIA:

Thompson, *Bartlett* 1713, August 9, 1909, M. Herb.

CONNECTICUT:

Fairfield, *Eames*, June 12, 1896, M. Herb.

NEW JERSEY:

Boonton, *Trelease*, month not given, 1913, U. of Ill. Herb.; Chatham, *Mackenzie* 189, May 30, 1903, M. Herb.; Cranberry Lake, *Mackenzie* 2596, June 9, 1907, M. Herb.; Franklin, *Rusby*, July 1875, P. D. & Co. Herb. This is the plant taken by Farwell for *P. biflorum* and illustrated on Plate 15, A, Bull. Torr. Club, 42: 1915.

DISTRICT OF COLUMBIA:

Chevy Chase, *Chase*, May 25, 1904, U. of Ill. Herb.

ILLINOIS:

Urbana, *Clinton*, May 27, 1900, U. of Ill. Herb.

TENNESSEE:

Lookout Mountain, *Schneck*, May 10, 1901, U. of Ill. Herb.

MARYLAND:

Sligo, *Chase*, May 18, 1905, U. of Ill. Herb.

INDIANA:

Chestnut Ridge, *Deam* 12720, May 11, 1913, D. Herb.; Clark County, *Deam* 5864, May 11, 1910, D. Herb.; Corydon, *Deam* 23384, June 3, 1917, D. Herb.; Cross Plains, *Deam* 16141, June 19, 1915, D. Herb.; Elizabeth, *Deam* 27887, June 11, 1919, D. Herb.; Evansville, *Deam* 16766, July 2, 1915, D. Herb.; Harrodsburg, *Deam* 25573, June 9, 1917, D. Herb.; Helmsburg, *Deam* 5983, May 21, 1910, D. Herb.; Huntingburg, *Deam* 27234, May 4, 1919, D. Herb.; Huntingburg, *Deam* 27239, May 4, 1919, D. Herb.; Lexington, *Deam* 27585, May 20, 1919, D. Herb.; Loogootee, *Deam* 17140, July 10, 1915, D. Herb.; Medora, *Deam* 24773, May 15, 1918, D. Herb.; Milltown, *Deam* 16434, June 25, 1915, D. Herb.;

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7. POLYGONATUM COMMUTATUM (J.A. & J.H.S.) Dietr.; Otto & Dietr. Gartenz., 3: 223, 1835.

Convallaria commutata J. A. & J. H. S. Syst. 7: 1671, 1830.

Polygonatum multiflorum b *americanum* Hook. Fl. Bor. Am. 2: 176, 1840, in part.

Polygonatum ellipticum Farwell, Bull. Torr. Club, 42: 255, 1915.

Polygonatum latifolium commutatum (J. A. & J. H. S.) Baker, Journ. Linn. Soc. Bot. 14: 555, 1875.

Polygonatum biflorum commutatum (J. A. & J. H. S.) Morong, Mem. Torr. Club 5: 115, 1894, in part.

Polygonatum biflorum Virginicum Farwell, Bull. Torr. Club 42: 254, Pl. 15B, 1915 and as to specimens cited, not *P. virginicum* Greene, 1906. In notes on Michigan Flora I I I, Farwell admits this is only *P. commutatum*, which he redescribes as *P. canaliculatum oblongifolium* q.v.

Polygonatum canaliculatum Farwell, Bull. Torr. Club 42: 255 Pl. 17A, 1915, not *P. canaliculatum* (Muhl.) Pursh, 1814.

Polygonatum biflorum hebetifolium Gates, Bull. Torr. Club 44: 121 Pl. 5, B, 1917, the plant from Watson, Mo.

Polygonatum canaliculatum oblongifolium Farwell, Notes on the Mich. Flora I I I, 181, 1921.

? *Convallaria parviflora* Poir. Encyc. Suppl. 4: 29. 1816.

? *Polygonatum parviflorum* (Poir.) Dietr.; Otto & Dietr., Gartenz. 3: 222, 1835.

TYPE LOCALITY: North America.

New Jersey to Ontario and Michigan, according to Farwell l.c. 256, 1916.

Pennsylvania to Georgia, Canada, Wisconsin, South Dakota, Iowa, Nebraska, Missouri, Kansas and Oklahoma, according to Gates l.c. 123, 1927.

I am referring Poiret's *Convallaria parviflora* to this species, as it appears to me to be only a reduced form of *P. commutatum*. However, an examination of the original specimen of Poiret's in the Desfontaine Herbarium in Paris, might show this to be some other species, but numerous collections since Poiret's time have failed to reveal any plant that agrees with Poiret's description.

NEW JERSEY:

Cranberry Lake, *Mackenzie* 2425, September 16, 1906, M. Herb.; Franklin, *Rusby*, August 1875, P. D. & Co. Herb. This specimen is cited by Farwell in Bull. Torr. Club 42: 256, 1915, as *P. canaliculatum americanum*.

IOWA:

Johnson County, *Fitzpatrick*, June 13, U. of Ill. Herb.; Muscatine, *Mackenzie* 90, May 28, 1892, M. Herb.; Muscatine, *Mackenzie* 90, May 8, 1894, M. Herb.

KANSAS:

Quindaro, *Mackenzie*, May 30, 1897, M. Herb.

MICHIGAN:

Belle Isle, *Farwell*, July 23, 1892, P. D. & Co. Herb. This specimen is labeled *P. biflorum virginicum* by Farwell and the number 1150A, pp. is written in another hand, but this number 1150A belongs to *P. biflorum ovatum*, which was collected at a different date from this.

INDIANA:

Albion, *Deam* 14697, August 25, 1914, D. Herb.; Aurora, *Deam* 16038, June 17, 1915, D. Herb.; Aurora, *Deam* 16109, June 18, 1915, D. Herb.; Bloomington, *Deam* 17506, July 17, 1915, D. Herb.; Bloomington, *Deam* 17507, July 17, 1915, D. Herb.; Bushrod, *Deam* 10682, May 26, 1912, D. Herb.; Cannelton, *Deam* 16626, June 29, 1915, D. Herb.; Cannelton, *Deam* 27146, May 2, 1919, D. Herb.; Carmel, *Deam* 9698, June 18, 1911, D. Herb.; Clark County, *Deam* 27626, May 25, 1919 D. Herb.; Eaton, *Deam* 8532, June 4, 1911, D. Herb.; Elisabeth, *Deam* 23336, June 1, 1917, D. Herb.; Evansville, *Deam* 16749, July 2, 1915, D. Herb.; Grantsbury, *Deam* 27801, June 9, 1919, named *P. conaliculatum oblongifolium* by Farwell; Howe, *Deam* 16749, July 2, 1915, D. Herb.; La-Grange County, *Deam* 20180, June 12, 1916, D. Herb.; Lake Gage, Steuben County, *Deam*, June 16, 1903, D. Herb.; Ligonier, *Deam* 14346, June 26, 1914, D. Herb.; Madison, *Deam* 8500, May 28, 1911, Middlebury, *Deam* 10966, June 4, 1912, D. Herb.; Miller, *Kienholz*, May 26, 1918, U. of Ill. Herb.; Mongo, *Deam* 26335, September 12, 1918, D. Herb.; Mount Vernon, *Deam* 8322A, May 24, 1911, D. Herb.; New Albany, *Deam* 14002, August 18, 1913, D. Herb.; New Albany, *Deam* 27931, June 13, 1919, D. Herb.; Newberg, *Deam* 25301, June 11, 1918 D. Herb.; New Harmony, *Deam* 909, May 25, 1906, D. Herb.; Patoka, *Deam* 16905, July 16, 1915, D. Herb.; Richmond, *Deam* 13136, June 4, 1913, D. Herb.; Troy, *Deam* 16656, June 30, 1915, D. Herb.; Van Buren, *Deam* 2049, June 16, 1907, D. Herb.; Veedersburg, *Deam*, June 5, 1905, D. Herb.; Vevay, *Deam* 13824, July 25, 1913, D. Herb.; Wabash County, *Deam* 2012, June 9, 1907, D. Herb.; Whiting, *Mason Bross*, June 7, 1880, U. of Ill. Herb.

MISSOURI:

Burge Park, *Mackenzie*, May 16, 1896, M. Herb.; Courtney, *Bush* 7996, June 7, 1917, U. of Ill. Herb.; Eolia, *Davis*, August 26, 1916, U. of Ill. Herb.; Hannibal, *Davis*, September 1, 1915, U. of Ill. Herb.; Ilasco, *Davis* 987, August 20, 1911, U. of Ill. Herb.; Neck City, *Palmer* 15872, August 16,

1919, P. Herb.; Oakwood, *Davis*, July 15, 1916, U. of Ill. Herb.; Watson, *Bush*, 527, June 1, 1894, cited by Gates as *P. biflorum hebetifolium*, and figured on Plate 5B, of this new variety, but undoubtedly *P. commutatum*; Webb. City, Palmer 15922, August 18, 1919, P. Herb.

OKLAHOMA:

Pawhuska, *Stevens* 1999, August 9, 1913, U. of Ill. Herb.

NORTH DAKOTA:

Devil's Lake, *Lunell*, June 26, 1913, U. of Ill. Herb.; Lake Ibsen, *Lunell*, September 3, 1914, U. of Ill. Herb.

ILLINOIS:

Champaign County, *C. Spruill*, May 29, year not given, U. of Ill. Herb.; Champaign County, *F. C. Gates* 2393, May 21, 1908, U. of Ill. Herb.; Champaign County *Peter Durkin*, May 26, 1876, U. of Ill. Herb.; Carlinsville, *Andrews*, May 19, 1854, U. of Ill. Herb.; Mascoutah, *Welsch*, 1864-1871, U. of Ill. Herb.; Mascoutah, *Welsch*, 1862, 1871, U. of Ill. Herb.; Potaka Island, Mount Carmel, *Schneck*, May 13, 1881, U. of Ill. Herb.; Palestine, *F. C. Gates*, 1888, U. of Ill. Herb.; Palestine, *F. C. Gates*, 1888, U. of Ill. Herb.; Peoria, *Brendel*, date not given, U. of Ill. Herb.; Peoria, *Brendel*, date not given, U. of Ill. Herb.; River Forest, Des Plaines Valley, *Agnes Chase*, May 25, 1896, U. of Ill. Herb.; Stark County, *U. H. Chase*, June 20, 1895, U. of Ill. Herb.; Taylorville, *O. DeMotte*, May 1896, U. of Ill. Herb.; Taylorville, *Ruby DeMotte*, June 4, 1897, U. of Ill. Herb.; Urbana, *C. A. Searle*, June 3, 1875, U. of Ill. Herb.; Waukegan, *F. C. Gates* 3025, June 16, 1909, U. of Ill. Herb.; 12th St. Station, Des Plaines Valley, *Agnes Chase*, May 4, 1896, U. of Ill. Herb.

8. *POLYGONATUM VIRGINICUM* Greene Leaflets, 1: 181. 1906.

Polygonatum biflorum virginicum (Greene) Farwell, Bull. Torrey Club 42: 123, 1917.

Stems rather slender 6-10 dm. tall more or less striate, at least below bearing seven to twelve leaves; leaves elliptical ovate elliptical 8-10 cm. long 4-5 cm. wide tapering to an ob-

tuse point, dark green above, glabrous and glaucous beneath, with 13 to 17 more or less conspicuous nerves, the 5 to 7 central ones a little more prominent; peduncles usually 2-flowered, or the lower sometimes 3-flowered, the upper often only 1-flowered; pedicles short, nearly equal; flowers tubular 12-16 mm. long.

TYPE LOCALITY: Bluffs of Holston River, Southeastern Virginia.

Virginia and Michigan according to Farwell, but the Michigan reference applies to *B. commutatum*, and the Virginia reference is taken from Greene. The specimens cited for this species and the one figured as *P. biflorum virginicum* by Farwell, belong to *P. commutatum*. Farwell has since admitted that his Michigan specimens are only *commutatum*.

Virginia and District of Columbia, according to Gates, the Virginia reference taken from Greene. Gates evidently did not understand this species, as it is more nearly related to *P. hebetifolium* than it is to *P. commutatum*.

SPECIMENS EXAMINED:

INDIANA:

Clark County, *Deam* 27603, May 25, 1919, D. Herb.; Salem, *Deam* 23186, May 29, 1917, D. Herb.

9. POLYGONATUM OVATUM (Farwell) n. sp.

Polygonatum biflorum ovatum Farwell, Bull. Torr. Club 42: 255, 1915.

Polygonatum commutatum ovatum (Farwell) Gates, Bull. Torr. Club 44: 124, 1917.

Salomonina commutata Farwell, Rep.Com.Parks Detroit 11: 53, 1900, in part, not *Polygonatum commutatum* (J. A. & J. H. S.) Dietr. 1835.

Stems terete, striate, at least below, 5-10 dm. tall, 4-8 mm. thick, bearing 9 to 13 leaves, and often a large foliaceous sheathing bract 10-15 cm. below the lower leaf; leaves ovate, orbicular, or broadly elliptical, 7.5-10 cm. long 20-40 mm. wide, with 7 to 31 nerves, the 7 to 9 central ones a little more prominent; peduncles stout, 25-35 mm. long, a little

flattened, 2- to 4-flowered; pedicels slender, 5-10 mm. long.

This appears sufficiently distinct in having leaves of a decidedly ovate character, about 8 cm. long and 5 cm. wide, with 7-9 principal veins.

TYPE LOCALITY: Belle Isle, Detroit River, Michigan.

Iowa, Nebraska, Michigan and Oklahoma, according to Gates, l.c. 124. 1917.

SPECIMENS EXAMINED:

MICHIGAN:

Belle Isle, *Farwell* 115A, June, 1892, P.D. & Co. Herb., TYPE of *P. biflorum ovatum*.

INDIANA:

Porterville, *Deam* 28221, July 17, 1919, D. Herb.; Tun-
nelton, *Deam* 24812, May 16, 1918, D. Herb.

MISSOURI:

Courtney, *Bush* 8000, June 8, 1917, U. of Ill. Herb.; Lake
City, *Bush* 7565, June 2, 1915, U. of Ill. Herb.

ILLINOIS:

Taylorville, *Andrews*, May 10, 1899, U. of Ill. Herb.; Tay-
lorville, *Andrews*, May 30, 1899, U. of Ill. Herb.

10. *POLYGONATUM GIGANTEUM* Dietr.; Otto & Dietr. Gar-
tenz 3: 222, 1835.

Polygatum multiflorum B americanum Hook. Fl. Bor.
Am. 246. 1840, in part.

Polygonatum biflorum Y. giganteum (Dietr.) Farwell,
Bull. Torr. Club 42: 256, 1915.

Stems stout, 12-20 dm. high, 1-2 mm. thick, bearing twenty-five to thirty-five leaves; leaves broadly oval, 12-20 cm. long, 8-18 cm. wide, with 40-50 more or less conspicuous nerves; peduncles stout, flattened 5-12.5 cm. in length, bearing two to nine flowers; pedicels 2-5 cm. long; flowers greenish-white, 14 to 20 mm. long; filaments somewhat flattened, smooth.

TYPE LOCALITY: North America.

Michigan, according to Farwell, l.c. 257, 1915.

Maryland, Pennsylvania, Wisconsin, Montana, Nebraska, Missouri, District of Columbia, Ohio, Illinois, Kentucky and Oklahoma, according to Gates, l.c. 124, 1917.

SPECIMENS EXAMINED:

MICHIGAN:

Rochester, *Farwell* 3473, July, 1914, P. D. & Co. Herb.

INDIANA:

Hendricks County, *Deam* 11236, June 22, 1912, D. Herb.; Marengo, *Deam* 27777, June 7, 1919, D. Herb.; Medora, *Deam* 28129, July 15, 1919, D. Herb.; Versailles, *Deam* 13789, July 23, 1913, D. Herb.

ILLINOIS:

Peoria, *McDonald*, July 1904, U. of Ill. Herb.

11. POLYGONATUM MELLEUM Farwell 20th Rept. Mich. Acad. Sci. 170, 1918.

Stems about 6 dm. high, bearing 15 or 16 leaves, leaves broadly ovate, or ovate elliptical, obtuse at the tip, sessile or the lower slightly clasping, 6-8 cm. long, 4-5 cm. wide, with 7-9 principal veins, which are very conspicuous; peduncles short, 1-2 cm. long the upper 2-flowered, the lower 4-flowered; flowers honey-yellow in color, about 12 mm. long and 3 mm. thick.

By the fewer, short, rounded leaves, 2-4-flowered, shorter peduncles, smaller flowers, and lower stem, this plant seems to me to be distinct from any North American species I have seen.

TYPE LOCALITY: Algonac, Michigan.

SPECIMENS EXAMINED:

MICHIGAN:

Algonac, *Farwell* 3974, June 16, 1915, TYPE, in open woods, P. D. & Co. Herb.

12. POLYGONATUM COBRENSIS (W. & S.) Gates, Bull. Torr. Club. 44: 126, 1917.

Salomonina cobrensis W. & S., Contrib. U. S. Nat. Herb. 16, 113, 1913.

TYPE LOCALITY: Copper Mines, Santa Rita, New Mexico.

SPECIMENS EXAMINED:

I have been unable to see any specimens of this recently described species, which appears to be far out of the known range of any other North American species, and is apparently from the description near *P. hebetifolium*, but may only be a much reduced form of *P. commutatum*, which further and more complete collections may determine.

For the more ready appreciation, I append the following comparison of *POLYGONATUM* names:

FARWELL, 1915.	GATES, 1917.	BUSH.
<i>pubescens</i>	<i>pubescens</i>	P. PUBESCENS Pursh.
<i>boreale</i>	<i>pubescens australe</i>	
<i>boreale</i>	<i>boreale</i>	
<i>boreale</i>	<i>hirtum</i>	P. BOREALE Greene.
		P. FARWELLII Bush.
<i>pubescens cuneatum</i>	<i>pubescens cuneatum</i>	P. CUNEATUM Greene.
	<i>biflorum</i>	P. BIFLORUM Elliott.
<i>biflorum</i>	<i>biflorum hebetifolium</i>	P. HEBETIFOLIUM Bush.
<i>canaliculatum</i>	<i>canaliculatum</i>	
<i>canaliculatum americanum</i>	<i>parviflorum</i>	P. COMMUTATUM Dietr.
<i>ellipticum</i>	<i>commutatum</i>	
<i>biflorum virginicum</i>	<i>ellipticum</i>	
	<i>commutatum virginicum</i>	P. VIRGINICUM Greene.
<i>biflorum ovatum</i>	<i>commutatum ovatum</i>	P. OVATUM Bush.
<i>canaliculatum giganteum</i>	<i>giganteum</i>	P. GIGANTEUM Dietr.
		P. MELLEUM Farwell.
	<i>cobrensis</i>	P. COBRENSIS Gates.

A GREAT BLUNDER.

By BENJAMIN FRANKLIN BUSH.

For five or six years past the State representatives of Missouri have been trying to select a flower to represent the State, and have appointed several committees to make the selection; the last one which made the selection to the eternal disgrace of the State of Missouri in-so-far as regards our State Flower.

Several years ago the writer was requested by the Chairman of the Committee to select the State Flower, to co-operate with the Committee and to make suggestions along the line of the selecting, and was finally asked by the chairman of the Committee to select an appropriate flower for the Committee.

My suggestions to the Committee were, that the flower selected should be a Missouri species, and should be a flower that was generally known to the people of Missouri, and particularly to the boys and girls of the State. After several days consideration of the species most eligible for the honor found in Missouri, I finally selected the White Adder's-Tongue, *Erythronium albidum*, often called Spring-Lily and Deer's-Tongue, one of the earliest, and one of the most conspicuous flowers we have in the State, and one that is familiar to every boy and girl of nearly the whole State.

This species was accepted by the Chairman of the Committee to select the State flower, and I supposed the matter settled, until I saw an account in the daily papers a year or so ago, that the Committee had recommended, and the State representatives had adopted, a flower for the State flower. My astonishment was so great when I read the accounts in the evening papers, that I could scarcely believe what I read, for I could not possibly see how any Committee could discard a flower so fittingly acceptable as was the White Adder's Tongue, for something—well, what did the Committee really select.

I called up the Chairman of the Committee on the telephone, and the lady told me that the newspapers had bungled the matter up, that the flower the Committee finally selected was an entirely different thing from the one the papers gave out as the one selected by the Committee. The newspapers throughout the State, and no doubt in other States, stated in their accounts of the selecting of the State Flower, that the committee had selected, and the State representatives had accepted, the Hawthorn for that honor.

The Chairman of the Committee informed me that the Committee had selected the Redhaw for the State Flower, as the one best known, and that the newspapers had changed the name to Hawthorn without their knowledge. I asked the Chairman to tell me what particular Redhaw of the fifty or sixty species that grow in Missouri, the Committee had selected to be the State Flower, and she said that it was the common Redhaw. I told her that there was no common Redhaw, and she said in reply that it was the common Redhaw, around Kansas City, which, if entered upon the records of the committee's report, would approximately fix the identity of the species.

I had a conversation with one other of the Committee to select the State Flower, some time thereafter, and she told me that the Committee had selected the Redhaw as the species to be honored, both on account of its beauty in flower and fruit and commonness throughout the State. In the first part of this statement, I fully agreed, although I could not conceive by the widest stretch of imagination how a tree loaded with white flowers in the Spring, and a load of scarlet fruit in the Autumn, could be a flower; but I took exception to the last part, as it is not a common species in the State, at least nine-tenths of the people in Missouri having never seen it, it being entirely unknown in southeastern and southern Missouri, and absent from Ozark Region.

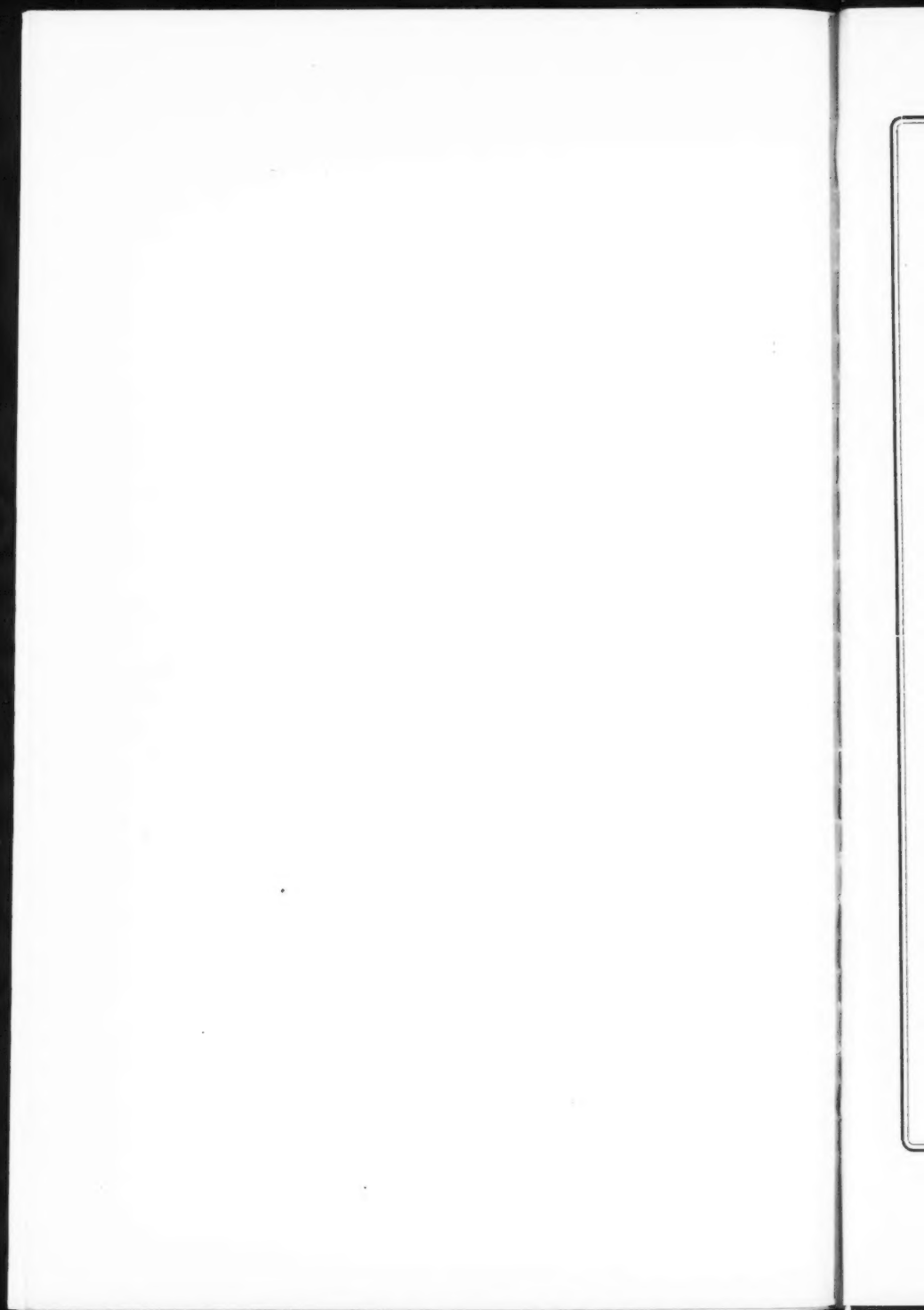
This lady further informed me when asked how the newspapers had happened to state that it was the Hawthorn that had been selected, that the Committee had thought the word Hawthorn was more appropriate than was the word Redhaw,

and that this name Hawthorn was the same as Redhaw, and sounded better.

At any rate, it has gone down into history so far as the newspapers and the public are concerned, that the Committee to select the State Flower has selected the Hawthorn for that honor, no matter if ninety-nine out of every hundred of the people of this State never saw the Hawthorn or probably never will see it.

There can be no doubt as to the identity of the flowers selected by other states for their State Flowers, notably Ohio, Colorado, Oklahoma, California, Texas, Kansas, Arkansas, Delaware, Louisiana, West Virginia, Minnesota, Montana and Utah. That the newspaper accounts of the selecting of the State Flower for Missouri have been accepted all over the country as applying to the English Hawthorn, one needs only to take up most any catalogue of trees and shrubs offered for sale, to prove this, and I have before me as I write this, "Rock's Garden Book for 1925," in which is cited the English Hawthorn as the Missouri State Flower.

I contend that a flower, or flowering shrub or tree, not generally cultivated in this State, and therefore unknown to the greater part of the people, cannot be selected for the State flower, and that fifty or sixty species of trees and shrubs do not constitute a flower, nor can they be selected as a State Flower. I content and maintain that the act of the Committee in selecting the State Flower, and that of the State representatives in adopting the one selected, transcends any piece of folly it has been my lot to observe. And I further contend and maintain that in-as-much as no specific plant was named, and no Missouri species was named in the newspaper accounts at that time, that Missouri has no State Flower.



NOTE

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